



Aalborg Universitet

AALBORG UNIVERSITY  
DENMARK

## Prospective evaluation of a decision support system providing advice on pressure support from states of over- and under-support

Spadaro, S.; Karbing, Dan Stieper; Volta, C. A.; Rees, Stephen Edward

*Published in:*  
Intensive Care Medicine Experimental

*DOI (link to publication from Publisher):*  
[10.1186/2197-425X-3-S1-A680](https://doi.org/10.1186/2197-425X-3-S1-A680)

*Creative Commons License*  
CC BY 4.0

*Publication date:*  
2015

*Document Version*  
Publisher's PDF, also known as Version of record

[Link to publication from Aalborg University](#)

*Citation for published version (APA):*  
Spadaro, S., Karbing, D. S., Volta, C. A., & Rees, S. E. (2015). Prospective evaluation of a decision support system providing advice on pressure support from states of over- and under-support. *Intensive Care Medicine Experimental*, 3(Suppl. 1), 334, No. A680. <https://doi.org/10.1186/2197-425X-3-S1-A680>

### General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal -

### Take down policy

If you believe that this document breaches copyright please contact us at [vbn@aub.aau.dk](mailto:vbn@aub.aau.dk) providing details, and we will remove access to the work immediately and investigate your claim.

POSTER PRESENTATION

Open Access

# Prospective evaluation of a decision support system providing advice on pressure support from states of over- and under-support

S Spadaro<sup>1\*</sup>, DS Karbing<sup>2</sup>, CA Volta<sup>3</sup>, SE Rees<sup>2</sup>

From ESICM LIVES 2015

Berlin, Germany. 3-7 October 2015

## Introduction

Providing appropriate pressure support (PS) is a balance of avoiding over-support with risk of muscle atrophy and prolonged weaning, and under-support with risk of patient discomfort and stress. The Beacon Caresystem (Mermaid Care, Denmark) advises on PS using physiological models of lung mechanics, respiratory drive, acid-base status and muscle function and clinical preference functions quantifying risk of muscle atrophy, patient stress, and lung trauma. Mathematical models are tuned to measurements allowing advice to be patient specific.

## Objectives

This study investigates the initial changes in pressure support from levels of over- and under-support.

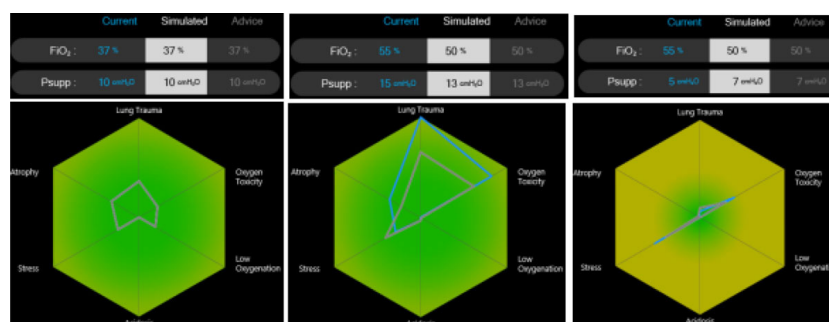
## Methods

Six ARDS patients residing in an ICU in Ferrara, Italy, have currently been included for this preliminary

analysis. Informed consent and ethical approval was obtained. System's advice was followed for an hour from states of over- and under-support defined as 150% and 50% of baseline PS or PEEP. Average and spread are reported as mean  $\pm$  SD.

## Results

SOFA score and age were  $6.2 \pm 1.9$  and  $71 \pm 5$  yrs, respectively. All patients were male. Four patients were subjected to PS changes and two to PEEP changes. Figure 1 illustrates response to over- and under-support as advice and preference functions in a patient where the system advised to return PS towards baseline. Average baseline PS was  $10 \pm 3$  cm H<sub>2</sub>O. On average, Advice from PS150% and PS50% changed PS to  $13 \pm 4$  cm H<sub>2</sub>O ( $114 \pm 25$  % baseline PS) and  $6 \pm 2$  ( $57 \pm 24$  % baseline PS), respectively. Only a single advice on PS was provided following PEEP changes.



**Figure 1** Advice of Beacon Caresystem.

<sup>1</sup>University of Ferrara / Intensive Care Unit, Ferrara, Italy

## Conclusions

These initial results indicate that Beacon Caresystem responds appropriately to over- and under-support.

## Grant Acknowledgment

DSK and SER are minor shareholders and perform consultancy for Mermaid Care.

## Authors' details

<sup>1</sup>University of Ferrara / Intensive Care Unit, Ferrara, Italy. <sup>2</sup>University of Aalborg / Respiratory and Critical Care Group, Department of Health Science and Technology, Aalborg, Denmark. <sup>3</sup>University of Ferrara / Intensive Care Unit, Morphology Surgery and Experimental Medicine, Ferrara, Italy.

Published: 1 October 2015

doi:10.1186/2197-425X-3-S1-A680

**Cite this article as:** Spadaro *et al.*: Prospective evaluation of a decision support system providing advice on pressure support from states of over- and under-support. *Intensive Care Medicine Experimental* 2015 **3** (Suppl 1):A680.

**Submit your manuscript to a SpringerOpen<sup>®</sup> journal and benefit from:**

- Convenient online submission
- Rigorous peer review
- Immediate publication on acceptance
- Open access: articles freely available online
- High visibility within the field
- Retaining the copyright to your article

---

Submit your next manuscript at ► [springeropen.com](http://springeropen.com)

---